



National Aeronautics and
Space Administration

Principal Center for Regulatory Risk Analysis and Communication

REGULATORY SUMMARY

Proposed Amendments to Ozone Depleting Substances Leak Repair Requirements

This information was prepared by NASA's Principal Center for Regulatory Risk Analysis and Communication (RRAC PC). If you have further questions or need assistance, please contact the RRAC PC Manager, Sharon Scroggins (256-544-7932, sharon.scroggins@nasa.gov).

Executive Summary

On 15 December 2010, the U.S. Environmental Protection Agency (EPA) proposed amendments ([75 Federal Register \[FR\] 78557](#)) to the leak repair standards under Section 608 of the Clean Air Act (CAA) ([40 Code of Federal Regulations \[CFR\] 82 Subpart F](#)) to lower the leak repair trigger rates for appliances containing more than 50 pounds (lbs) of ozone depleting substances (ODSs). The amendments would streamline existing requirements for record keeping and reporting and reduce emissions of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) by requiring additional appliance retrofits or replacements for leaking appliances. Comments regarding the proposed rule are due to EPA by 14 February 2011.

Potential Impacts to NASA

If finalized, National Aeronautics and Space Administration (NASA) Centers and other facilities that operate appliances containing more than 50 lbs of ODS refrigerants would be required to comply with the requirements. Facilities should note that leak repair regulations do not apply to appliances using non-ODS substitutes such as Hydrofluorocarbon (HFC) 134a (R-134a), although such systems must comply with the venting prohibitions at [40 CFR 82.154](#). Comments about the proposed rule should be provided to Sharon Scroggins (sharon.scroggins@nasa.gov) by 1 February 2011.

Summary of Proposed Rule

This proposed rule would streamline requirements and establish similar leak repair requirements for owners or operators of comfort cooling, commercial refrigeration, and industrial process refrigeration appliances. The proposed amendments are summarized in the following sections.

Definitions

EPA is requesting comments on the following definitions.

Term	Summary
Comfort Cooling Appliance	<p>Not previously defined by EPA. Proposed definition:</p> <p>"Any air-conditioning appliance used to provide cooling in order to control heat and/or humidity in facilities, such as office buildings and computer rooms. Comfort cooling appliances include building chillers, as well as roof-top self-contained units typically used to cool small to medium-size office and light commercial buildings. Chillers that would be subject to the leak repair requirements include, but are not limited to, those using R-12, R-11, and R-123. Self-contained units that provide comfort cooling that would be captured by the proposed definition of comfort cooling appliance include, but are not limited to, those using R-22."</p>
Commercial Refrigeration Appliance	<p>Proposed changes to the definition include the following:</p> <ul style="list-style-type: none"> • Removing the last sentence, which references equipment "typically over 75 lbs." This sentence has caused confusion because the leak repair requirements apply to equipment containing more than 50 lbs of refrigerant • Including "rack system" in the definition. This means that all of the major refrigeration components making up the refrigerant circuit typically found in refrigeration equipment, including the condenser, compressor rack, receiver, evaporator, filter driers, and liquid and suction manifolds, make up the commercial refrigeration appliance.
Critical (Appliance) Component	<p>Proposed changes to the definition include the following:</p> <ul style="list-style-type: none"> • Delete the term "critical" and simply define "component." • Remove the safety aspect from the definition because, although safety is vital, it should not be used as a means of distinguishing what meets the proposed revised definition of "component."
Initial and Follow-up Verification Tests	<p>Proposes to change the definition of follow-up verification to include that follow-up verification tests occur no sooner than one full day (24 hours) after the repairs to the leaking appliance have been completed, but within 30 days of the appliance repair.</p>

Term	Summary
Full Charge and Seasonal Variance	<p>The current definition of full charge provides four options for determining full charge and states that one or a combination of the following four methods may be used:</p> <ul style="list-style-type: none"> • Use the equipment manufacturer's determination of the correct full charge for the equipment; • Determine the full charge by making appropriate calculations based on component sizes, density of refrigerant, volume of piping, and other relevant considerations; • Use actual measurements of the amount of refrigerant added or evacuated from the appliance; and/or • Use an established range based on the best available data regarding the normal operating characteristics and conditions for the appliance, where the midpoint of the range will serve as the full charge. <p>EPA proposes to change the definition of full charge by:</p> <ul style="list-style-type: none"> • Removing the statement allowing for a combination of options to be used. Only one of the four methods would be allowed for determining full charge. • Requiring maintenance of a written record documenting the determination of the full charge, regardless of the means used to make such a determination. • Amending the second method above to address seasonal variance or other relevant considerations. <p>A definition of seasonal variance also is proposed as follows: "The need to add refrigerant to an appliance due to a change in ambient conditions caused by a change in season, followed by the subsequent removal of refrigerant in the corresponding change in season, where both the addition and removal of refrigerant occurs within one consecutive 12-month period."</p>
Industrial Process Refrigeration	<p>Proposes to clarify that the definition of industrial process refrigeration includes the industrial process refrigeration appliances found in an array of manufacturing industries.</p>
Leak Rate	<p>Proposes to change the definition of leak rate by removing the annualizing method (Method 1) and only allowing the rolling average method when calculating leak rate.</p>
Normal Operating Characteristics or Conditions	<p>Proposes to include full charge as a normal operating characteristic and to remove a reference to a regulatory citation.</p>
Retrofit, Repair, and Retire	<p>Clarifies the three definitions to make them distinct, including the following proposed changes:</p> <ul style="list-style-type: none"> • Repairs: An action that addresses the leaking appliance or more specifically the affected component(s) of the leaking appliance. Repairs may include replacement of components or component subassemblies, whereas a retrofit involves the conversion of an appliance so that it is compatible for use with a substitute with a lower ozone depleting potential (ODP). • Retrofit: often require changes to the appliance (for example, change in lubricants, filter driers, gaskets, o-rings, and in some cases, changes in components) to achieve system compatibility. The concern with the current definition is that by allowing a retrofit to a refrigerant with an equivalent ODP, EPA unintentionally could allow the continued use of the same refrigerant that leaked from the appliance. EPA is proposing a definition for "retrofit" that means the repair and conversion of an appliance from an ODS refrigerant to a substitute with a lower ODP. • Retire: EPA had not previously defined retire, although it is used throughout the leak repair regulations. EPA is proposing a definition for retire to include "the permanent removal from service of the entire appliance rendering it unfit for use by the current or any future owner or operator."

Required Practices

The following sections outline the proposed leak repair practices. It should be noted that leak repair regulations do not apply to appliances using non-ODS substitutes such as HFC 134a (R-134a), although such systems must comply with the venting prohibitions at [40 CFR 82.154](#).

Repair of Leaks and Leak Repair Trigger Rates

EPA is proposing that owners or operators of comfort cooling, industrial process refrigeration, or commercial refrigeration appliances with a full charge greater than 50 lbs of ODS refrigerant must repair any leaks within the appliance within 30 days of the date the leak rate exceeds the applicable leak repair trigger rate. EPA does not intend to require that owners or operators address leaks from appliance valves, seals, gaskets, and other fittings. However, EPA encourages appliance owners or operators to address leaks from fittings as a best practice, especially if addressing such leaks will reduce the leak rate of the appliance.

Applicable Leak Rate for Commercial, Comfort Cooling, and Industrial Process Refrigeration Appliances

By proposing lower leak repair trigger rates, EPA intends to reduce use and emissions of ODSs from appliances with large refrigerant charges, particularly as they age. EPA is proposing to tighten the leak repair rates as outlined below:

Appliance Type	Current Leak Rate	Proposed Leak Rate
Comfort cooling	15 percent	10 percent
Commercial refrigerant	35 percent	20 percent
Industrial process refrigeration appliances	35 percent	20 percent

Addition of Refrigerant Due to Seasonal Variances

Under the proposed leak repair required practices, owners or operators must determine the full charge of the appliance to determine the appliance's leak rate. Owners or operators of appliances without properly sized receivers that need to add refrigerant to the appliance in the fall or winter also would have to remove refrigerant the next spring to prevent high head pressures at design ambient conditions. Both the addition and removal must take place within a consecutive 12-month period.

Verification of Repairs

The current leak repair verification requirements only apply to owners or operators of industrial process refrigeration and federally owned commercial and comfort cooling appliances whose owners are granted additional time to make repairs. EPA is proposing a requirement that all owners or operators of commercial, industrial process refrigeration, and comfort cooling appliances with refrigerant charges greater than 50 lbs that leak above the annual leak repair trigger rate, repair all leaks within 30 days of discovery (as made evident by the need to add refrigerant that is not the result of a seasonal variance) and perform both initial and follow-up verification, where the follow-up verification occurs no sooner than 24 hours after repairs have been made and no later than 30 days after repairs have been made.

Requirement to Develop and Complete Retrofit and Retirement Plans

EPA currently requires owners or operators of industrial process refrigeration appliances that have failed an initial or follow-up verification test to develop a dated and written retrofit and retirement plan within 30 days of the failed verification and implement the plan within 1 year.

EPA's proposed retrofit and retirement plans must include at a minimum:

- Identification and location of the appliance
- Type and full charge of the refrigerant used by the leaking appliance
- Type and full charge of the substitute to which the appliance will be converted, if retrofitted
- Itemized procedure for the appliance conversion to a substitute with a lower ODP, including changes required for compatibility with the new substitute (for example, procedure for flushing old refrigerant and lubricant; and changes in lubricants, filters, gaskets, o-rings, or valves)
- Plan for the disposition of recovered refrigerant
- Plan for the disposition of the appliance, if retired
- Six-month schedule for completion of the appliance retrofit or retirement

Owners or operators of comfort cooling and commercial refrigeration appliances currently are not required to perform verification tests and, in lieu of making repairs within 30 days, are given the option to draft and implement retrofit and retirement plans within 30 days of discovering a leak greater than the applicable trigger rate. EPA is proposing two options:

- Require owners or operators of comfort cooling, commercial refrigeration, and industrial process refrigeration appliances to replace a leaking component in its entirety upon failure of an initial or follow-up verification test. Under this scenario, EPA could require replacement of the leaking component and all of its subassemblies within 30 days of the failed verification.
- Allow owners or operators to decide on a case-by-case basis if a component or its subassembly requires replacement to completely repair the appliance. This option would allow a greater level of flexibility to owners or operators of affected appliances; however, such flexibility could result in increased refrigerant emissions by allowing appliance owners or operators to make multiple repair attempts to an appliance or a specific appliance component in lieu of taking action to completely repair the appliance via a component replacement.

EPA also proposes to shorten the 1- year timeframe that currently is granted to owners or operators to complete appliance retrofit and retirement plans to a 6-month timeframe for appliances that have encountered three failed verification tests (either initial or follow-up) within a consecutive 6-month period.

Extension to Repair and Retrofit and Retirement Timeline

EPA is proposing to streamline the extension process and extend it to owners or operators of all appliance categories. EPA proposes to allow extensions to the requirement to repair leaks within 30 days, if the leak rate of the appliance is above 20 percent for industrial process refrigeration and commercial refrigeration appliances and 10 percent for comfort cooling appliances, regardless if they are federally owned. EPA also proposes to grant similar

extensions to all appliance owners or operators who cannot complete required retrofit and retirement plans in the proposed 6-month timeframe, provided that record-keeping requirements are met.

The extensions would apply to all appliances and not be limited to industrial process refrigeration or federally owned commercial refrigeration appliances if appropriate records are maintained in accordance with [40 CFR 82.166\(o\)](#) and any one of the following conditions applies:

- The appliance is located in an area subject to radiological contamination or where the shutting down of the appliance would directly lead to radiological contamination
- The necessary parts for an appliance component are unavailable and the owner or operator maintains a written statement from the appliance or component manufacturer or distributor stating the unavailability of parts
- Other applicable federal, state, or local regulations make a repair within 30 days impossible

When the extension is required due to the unavailability of parts within 12 weeks of the 6-month period to complete retrofit plans, EPA proposes to limit the extension to an additional 12 weeks beyond the date that the necessary parts or components are delivered.

EPA also proposes to remove the existing 120-day exemption when owners or operators of industrial process refrigeration appliances undergo an industrial process shutdown. The definition of industrial process shutdown and all references to the definitions in the required practices of [40 CFR 82.156](#) also would be deleted.

Worst Leaker Provision

Appliance owners or operators have the flexibility to decide what actions to take in order to complete repairs. These actions may or may not include the complete replacement of a leaking component or one or more of its subassemblies because current leak repair required practices can allow a leaking appliance to undergo multiple repair attempts.

In an effort to eliminate refrigerant releases that often accompany such repeated repair attempts, EPA is proposing two options as possible changes to the required practices at [40 CFR 82.156\(m\)](#). Under these options, EPA would require equipment to be retrofitted to a refrigerant or substitute with a lower ODP or retirement of the entire appliance in certain circumstances if:

- The equipment experiences three component replacements during a consecutive 6-month period that occur as a result of a failed initial or follow-up verification.
- The equipment fails three initial or follow-up verifications during a consecutive 6-month period.

Reporting and Recordkeeping

Proposed record-keeping requirements would need to be maintained onsite, at the location of the affected appliance, for a minimum of 3 years. The following table outlines proposed record-keeping requirements.

Record Type	Proposed Requirements
Service Records	<p>EPA is proposing that all persons (in-house or external parties) servicing appliances with charge sizes greater than 50 lbs provide the owner or operator with an invoice or other documentation that indicates:</p> <ul style="list-style-type: none"> • The date and type of service • The physical location of all leaks that were repaired • The amount and type of refrigerant recovered from the appliance • The type and results of initial and follow-up verification tests • The quantity and type of refrigerant added to the appliance • All calculations, measurements, and assumptions used to determine the leak rate of the appliance upon each addition of refrigerant
Records Documenting the Fate of Recovered Refrigerant	<p>Any person who sends used refrigerant offsite to a new owner would need to maintain records of the types and amounts of used refrigerant sent offsite for any reason (such as storage, recycling, reclamation, destruction, etc.). The records must include the name and address of the facility accepting the used refrigerant, the type and amount of refrigerant transferred, and the date the refrigerant was transferred.</p>
Extensions to Repair and Retrofit and Retirement Timelines	<p>Owners or operators who are granted additional time, beyond 30 days, to make repairs or more than 6 months to implement retrofit and retirement plans would be required to maintain records justifying the need for additional time.</p>
Documenting the Determination of the Appliance Full Charge	<p>Owners and operators would be required to maintain documents showing all data, including calculations and assumptions, used to determine the full charge.</p>
Documenting Seasonal Variance	<p>Owners and operators would be required to maintain records of the quantity and type of ODS and date refrigerant is added or removed due to seasonal variance.</p>
Destruction of Purged Refrigerant	<p>EPA is proposing to remove the record-keeping and reporting requirements related to documenting purged and destroyed refrigerant.</p>
Applicability to Residential and Light Commercial Appliances	<p>Although the leak repair requirements do not apply to owners or operators of such appliances, persons servicing, maintaining, or repairing them are not allowed to intentionally release refrigerant into the atmosphere (40 CFR 82.154(a)(1) and (2)).</p>